ABSTRACTS

1. **Factors in the corrosion of brasses —**

M. C. Steele (Australasian Corrosion Engineering, **7,** No. 1, 13, 1963). Some of the important conditions which influence the course of the corrosion of brass are reviewed; chemical composition, oxygen, grain size and potentials; 48 references.

2. **Electrical polarization technique useful for corrosion studies —**

(NBS Tech. News Bull, **46,** 177, 1962). Electrical measurements have been used to calculate the corrosion rates and resulting weight losses of iron-chromium and iron-chromium-silicon specimens. It appears that this technique may have practical applications in evaluating the effects of different alloying constituents on corrosion behaviour, or in the screening of materials for long-time exposure studies. See also W. J. Schwerdtfeger, Corrosion **19,** 17t, 1963.

3. **New techniques for measuring corrosion with resistance probes —**

W. R. Scott and D. Roller (Materials Protection, **2,** No. 1, 42, 1963). The article describes a number of applications of the electrical resistance method for measuring corrosion in problematic situations not easily solved by conventional methods: measurement of metal loss as influenced by micro-organisms, monitoring failure of protective coatings, studying corrosion of steel rods in concrete and measuring corrosion caused by organic packaging materials.

4. **Corrosion and the chemical engineer —**

T. L. Rama Char (Indian Chemical Engineer, **5,** No. 1, 28, 1963). An outline of the importance of corrosion problems in chemical engineering under: introduction, chemical engineering and corrosion, corrosion in chmical plants, design problems, teaching of corrosion science and engineering. Twelve references.

5. **Use of potentiostats in corrosion studies —**

I. Dugdale (J. Appl. Chem., **13,** 41, 1963). Introduction, development of potentiostats, corrosion behaviour, practical applications, electrochemical kinetics, future tends. Four tables, 11 figures and 55 references.

6. **Role of pH in electrochemical corrosion —**

S. L. Chawla (Chem. Age of India, **14,** No. 2, 163, 1963). Introduction, effect of pH on corrosion rate and potential, results for zinc lead and stainless steel, anodic polarization of zinc.

7. **Analytical techniques in corrosion product identification —**

D. A. Vaughan (Corrosion, **19,** 55t, 1963). This article outlines the generally applicable techniques for identifying the intermediate and final products of corrosion processes.

8. **Design problems in corrosion engineering —**

J. Sundararajan and T. L. Rama Char ("Chemical Process Design — A Symposium", July 1961, CSIR, New Delhi, 153, 1963). The importance of design in the prevention of metallic corrosion in the chemical industries has been outlined. The problems of design in corrosion engineering have been discussed with special reference to economics, electrochemical theory, process and structural design, materials of construction and protective measures. Twentyfive references.

9. **Casebook of a corrosion detective —**

T. M. Krebs (Chem. Engg, **70,** No. 3, 122; No. 4, 186, 1963). The corrosion detective shows how he finds causes of failure by the use of laboratory test data, knowledge and native wit.

10. **The metal finishing industry and the application of modern management techniques —**

P. A. Cartwright (Electroplating and Metal Finishing, **16,** 38, 1963).

11. **Effect of operating conditions on the properties of sulphuric acid anodic oxide coatings —**

A. Prati, F. Sacchi and G. Paolini (Electroplating and Metal Finishing, **16**, 44, 1963). Applicational properties, comparison of test results, discussion ; 17 references.

12. **Anodizing in practice — Recent advances. Part 1, 2 —**

F. C. Porter (Corrosion Technology, **10**, 5, 40, 1963). Introduction, bright anodizing, conventional architectural anodizing; 5 tables, 4 figures and 15 references ; conventional hard anodizing, anodizing in electrical engineering, general, specification and quality control.

13. **Technical developments of 1962 —**

N. Hall (Metal Finishing, **61**, No. 1, 44, 1963). Review of the metal finishing field under degreasing and cleaning, pickling, polishing, anodizing, metallic coatings, electroforming — metallizing—vapour coating, conversion films,— corrosion prevention, testing and control, miscellaneous; 452 references.

14. **Science for electroplaters 77, 78, 79 chromium — ;**

L. Serota (Metal Finishing, **61**, No. 1, 85 No. 2, 67; No. 3, 78; No. 4, 69; No. 5, 72, 1963). Introduction, decorative chromium, corrosion, plate thickness; crack-free chromium; buff dull and bright nickel, duplex nickel, duplex chromium; dual chromium, microcracks, chromium-nickel-chromium, nickel-chromium-nickel; structure, passivity, complex ions, positive molecular ion.

15. **Bibliography and abstracts — Plating by thermal decomposition : Part 3, 4—**

R. L. Hoyle (Plating, **50**, 45, 139, 1963) Abstracts 139 to 251, 252 to 352.

16. **Engineering applications of electrochemistry — 2. Some modern methods of hard chromium plating — 3, 4 —**

J. D. Greenwood (Metal Finishing J, **9**, 45, 105, 1963). Finishing hard chromium deposits; properties and industrial applications.

17. **Electroplating with electrolytic nickel in titanium baskets —**

T. J. Callaghan (Metal Finishing J, **9**, 59, 1963). Nickel anodes in use today, comparison, with basket anodes, electrolytic nickel, electrode polarization, titanium metal, the Atlas method, progress in the U.K., voltage, anode-arrangement, area, current density and bags, French nickel for polypropylene basket anodes.

18. **Industrial electrolytic polishing in France —**

R. Mondon (Metal Progress, **83**, No. 1, 95, 1963). Introduction, improved surfaces obtained, decorative plating, stainless steel for auto trim, aluminium and its alloys, copper and its alloys, polishing of small articles, technical applications of electropolishing, electrolytic super-finishing, electrolytic deburring, changing the shape, preparing parts for plating. Table giving various processes and operating data.

19. **Electroplating on titanium and titanium alloys —**

W. B Harding (Plating, **50**, 131, 1963). Introduction ; literature survey—anodic etch, chemical etch, vapour blast — electroless nickel, hydrochloric acid etch ; experimental work including electroless nickel baths, heat treatment, gold plating and hydrogen embrittlement. It is concluded that any metal than can be electrodeposited can be plated on titanium and its alloys by one or more of several processes. Two tables, 3 figures and 13 references.

20. **Latest techniques in technical gold plating —**

W. T. Lee (Corrosion Technology, **10**, 59, 1963). Electrodeposition, properties of deposits, printed circuits, barrel plating; 12 references.

21. **Russian practice in precious metal plating —**

A. M. Yampolsky (Electroplating and Metal Finishing, **16**, 76, 1963). Silver, gold, platinum, palladium, rhodium, iridium, indium, rhenium; bath composition and operating conditions.

22. **Chemical vapor deposition — a rediscovered tool for molecular engineering —**

J. M. Blacher (Battelle Technical Review, **12**, No. 3, 2, 1963). Current applications, need for better understanding, applications under development ; 12 references.

23. **Decorative anodized aluminium —**

C. C. Cohn (Products Finishing, **27**, No. 6, 54, 1963). An unusual approach to decorative anodizing : thin, properly sealed anodic coatings resist corrosion and abrasion better than thick ones.

24. **Electrodeposition of cobalt from the sulphamate bath —**

S. Venkatachalam and T. L. Rama Char (Metal Finishing, **61**, No. 3, 62, 1963). The optimum conditions have been established for obtaining satisfactory deposits of cobalt from the sulphamate bath at cathode efficiencies from 60 to 100 per cent, anode efficiencies close to 100 per cent, and limiting current density of 12 amp/dm^2. This bath is comparable in performance to the sulphate and chloride baths. Two tables, 10 figures and 18 references.

25. **Electroplated coatings on molybdenum —**

L. Domnikov (Metal Finishing, **61**, No. 4, 64, 1963). Introduction, chromium plating molybdenum, plating on chromium plated molybdenum, properties of coatings, conclusions.

26. **Engineering applications of electrochemistry—3. Some applications of electroforming —**

D. Fishlock (Metal Finishing J, **9**, 135, 1963), Review with 9 figures and 8 references.

27. **Cobalt-zinc alloy deposition from the pyrophosphate bath —**

D. V. Subrahmanyam and T. L. Rama Char (Chemistry and Industry, 697, 1963). The optimum conditions have been established for the co-deposition of cobalt with zinc from pyrophosphate plating solutions. It is possible to obtain alloys of any desired composition by a variation in the experimental conditions. The limiting current density is 15 amp/dm^2. Table showing effect of variables on deposit composition, cathode efficiency and potential.

28. **Electrodeposition of iron from the sulphamate bath —**

S S. Misra (Indian J. Tech., **1**, 208, 1963). Detailed studies have shown that the sulphamate bath is satisfactory for the plating of iron at efficiencies close to 100 per cent. The throwing power of the solution has been measured with a modified Haring-Blum cell. The bath is comparable to the sulphate and chloride baths for iron plating. Two tables, 6 figures and 20 references.

29. **Electrodeposition of copper-cobalt alloys. Pyrophosphate baths —**

D. V. Subrahmanyam and T. L. Rama Char (Metal Finishing, **61**, No. 5, 68, 1963). The pyrophosphate bath has been found to be suitable for the plating of copper-cobalt alloys containing 6-99 per cent copper. The effect of variables on deposit composition, cathode efficiency and potential has been shown in a table. Eight references.

30. **The electrodeposition of nickel-molybdenum alloys —**

N. W. Hovey, A. Krohn and G. M. Hanneken (J. Electrochem. Soc., **110**, 362, 1963). Pyrophosphate solutions can be used to deposit nickel-molybdenum alloys containing about 60 per cent molybdenum and 4.5 per cent nonmetallic material. The plates were bright and adherent, and the cathode efficiency about 38 per cent.

31. **Impact of automation on the electroplating industry —**

S. H. Grindrod (Industrial Finishing, **15**, No. 179, 39, 1963). Introduction, processes, choice of plant, special features, selective or programmed plants.

32. **Finishing treatments for aluminium —**

B. A. Scott (Industrial Finishing, **15**, No. 179, 45, 1963). Chemical conversion treatments, anodizing, electrochemical and chemical brightening, self-coloured finishes, hard anodizing, electroplating, vitreous enamelling.

33. **Bismuth plating on steel from alkaline electrolytes —**

J. A. McCarthy (Metal Finishing, **61**, No. 5, 58, 1963). Adherent bismuth coatings can be plated directly on steel from solutions containing bismuth chloride, potassium pyrophosphate, EDTA, dextrin and hydrochloric acid to reduce the pH to about 10.

34. **Feasibility of electrodeposition of nickel from EDTA based solutions on to zinc and zinc alloys —**

D J. Alner and D. T. Wall (Plating, **50**, 397, 1963) Solutions containing nickel sulphate and chloride, EDTA, hexamine, triethanolamine and saccharin should be capable of development for use in depositing nickel directly on to zinc alloys. Five figures and 13 tables.

35. **Bibliography of metal finishing wastes for 1962 —**

D. G. Foulke (Plating, **50,** 406, 1963). Sixty-three references to papers published in 1962 and 8 references to 1961.

36. Electrolytic oxidation of strong cyanide wastes —

M. C. Dart, J. D. Gentles and D. G. Renton (J. Appl. Chem., **13,** 55, 1963). A method for the continuous destruction of solid cyanide waste, on a laboratory scale, by electrolytic oxidation is described. The only products of the process are gaseous-ammonia, carbon dioxide and hydrogen; and solid-sodium carbonate containing 0 05 per cent cyanide and 0.26 per cent sodium oxalate; 1 kwh. of electricity destroying 111-143 g of hydrogen cyanide.

37. Electrolytically regenerated manganic sulphate for the oxidation of aromatic hydrocarbons, II. Oxidation of xylenes to tolualdahydes —

R. Ramaswamy, M. S. Venkatachalapathy and H. V. K. Udupa (J. Electrochem. Soc, **110,** 202, 1963). A two-stage process for the oxidation of xylenes to tolualdehydes is described which consists of the oxidation of manganous to manganic sulphate in the cell and reacting the latter with xylene outside the cell. The low current efficiency for the in-cell oxidation is explained on the basis of anode potentials.

38. Improvement in the electrolytic preparation of iodoform —

R. Ramaswamy, M. S. Venkatachalapathy and H. V. K. Udupa (J. Electrochem. Soc, **110,** 294, 1963). Use of lead dioxide anode with a graphite substrate in the electrolytic preparation of iodoform is described.

39. Electrolytically regenerated periodic acid for the oxidation of starch to dialdehyde starch —

R Ramaswamy, M. S. Venkatachalapathy and H. V. K. Udupa (Indian J. Tech., **1,** 115, 1963). The preparation of dialdehyde starch by electrolytic oxidation of tapioca starch using iodic acid as the electrolyte has been studied. Twelve tables, 3 figures and 16 references.

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(*Continued from page 65*)

chloric acid. The method evolved by Merck of Darmstadt is a continuous one, the chlorine which is dissolved in dilute perchloric acid being converted to the acid in a highly pure form in a single stage. Performance figures show a current efficiency of 60 per cent, a 40 per cent product containing no more than 0.1 and 0.02 per cent respectively of hydrochloric acid and chlorine.— British Chemical Engineering, Vol. 8, 300, 1963.

Corrosion Congress in Europe

The Third Congress of the European Federation of Corrosion was held in Brussels from June 4 to 7, 1963. Seventythree papers were presented by authors from various parts of the world (Austria, Belgium, Czechoslovakia, East Germany, France, Holland, Hungary, India, Italy, Poland, Switzerland, U.K., U.S.A., West Germany) in 6 sessions: (1) Fundamental studies. (2) Protection by metallic coatings, (3) Protection by inorganic coatings, (4) Protection by organic coatings, (5) Inhibitors and passivating agents, and (6) Cathodic protection. A paper on 'Thiourea as an Inhibitor for the Corrosion of Aluminium and Its Alloys in Hydrochloric Acid Solutions' was presented by T. L. Rama Char (India).

— T.L.R.